National Animal Health and Agrifood Quality Service

(SENASA)

Risk Analysis Unit

QUESTION 8:

LIVESTOCK DEMOGRAPHICS AND MARKETING PRACTICES IN THE REGION

November 2002

LIVESTOCK DEMOGRAPHICS AND MARKETING PRACTICES IN THE REGION

HOW MANY HERDS, FLOCKS, ETC., OF EACH RELEVANT SPECIES ARE IN THE REGION?

The population of susceptible FMD animals in Argentina includes 52,500,000 bovines, 13,800,000 sheep, 2,500,000 hogs and 2,400,000 goats. The main cattle production area is in the Provinces of Buenos Aires, Santa Fe, Córdoba, Entre Ríos, Corrientes and La Pampa which has 44,500,000 bovines, 2,700,000 sheep, 2,000,000 hogs and 300,000 goats.

The distribution of the cattle population in Argentina is shown below.

Table 2: Number per type of operation (2002)

Type of Operations	
Dairy	15,604
Cow-calf Operations	103,913
Fattening	23,383
Mixed (breeding & fattening)	65,821
Subsistence	32,823

Table 3: Demographics of the Cattle Population in Argentina, per Province (2002)

REGION	PROVINCE	BOVINES	SHEEP
CENTRAL	Buenos Aires	19,391,640	1,374,991
	Chaco	1,910,969	72,974
	Córdoba	6,257,395	59,361
	Formosa	1,441,073	36,991
	La Pampa	3,524,017	124,036
	S. del Estero	1,128,557	140,405
	San Luis	1,511,988	54,500
	Santa Fe	6,410,569	73,260
	Total for the Region	41,576,208	1,936,518
MESOPOTAMIA	Misiones	257,164	5,874
	Corrientes	4,107,914	1,530,945
	E. Ríos	4,197,860	388,760
	Total for the Region	8,562,938	1,925,579
CUYO	Mendoza	512,459	42,077
	San Juan	34,062	1,886
	Total for the Region	546,521	43,963
NOA (North-West)	Catamarca	125,999	20,515
	La Rioja	204,833	22,263
	Jujuy	85,433	601,105
	Salta	455,662	43,857
	Tucumán	125,218	9,342
	Total for the Region	997,145	697,082

NORTHERN PATAGONIA	Neuquén	123,069	216,900
	Río Negro	581,912	2,132,829
	Total for the Region	704,981	2,349,729
SOUTHERN PATAGONIA	Chubut	121,068	4,002,342
	Santa Cruz	33,615	2,333,526
	Tierra del Fuego	20,480	553,605
	Total for the Region	175,163	6,889,473
TOTAL		**52,562,956**	**13,842,344**

HOW ARE THEY DISTRIBUTED (E.G., HERD DENSITY, ETC.)?

The cattle population is concentrated in the center and to the northwest of Argentina. Different ecosystems determine different production areas: a fattening area (western part of Buenos Aires, south of Santa Fe, southeast of Córdoba, south of Entre Ríos, and northeast of La Pampa); and two breeding areas: the Salado River Basin (eastern part of Buenos Aires) and the northeastern region.

There are 15,604 dairy farms with a population of 2,000,000 dairy cows. These operations are mainly located in three dairy basins: Córdoba-Santa Fe, Abasto (Buenos Aires); and Mar y Sierra (Buenos Aires).

Sheep production is declining in Argentina. There are approximately 18,000 farms with an average of 667 animals. These operations are concentrated in three regions: Patagonia (Río Negro, Santa Cruz, Chubut and Tierra del Fuego), Buenos Aires and Mesopotamia (Entre Ríos, Corrientes and Misiones).

Hog farms are mainly along the corn belt (North of Buenos Aires, South of Santa Fe and Córdoba).

Goat production is not much developed in Argentina. The goat population (2,500,000 animals) is mainly in the marginal northwest areas, the foothills of the Andean Range, the semiarid valleys in the North and the semiarid area in the center of the country (hills and the Chaco area).

South American camelidae populate the semiarid plateau of Patagonia (guanacos), and the highlands in the northwest (llamas, alpacas and vicuñas).

WHERE ARE THE MAJOR LIVESTOCK MARKETING CENTERS?

The major livestock marketing centers are located in the breeding and fattening areas. There are two main livestock concentration markets for animals for slaughter: Liniers (Buenos Aires) and Rosario (Province of Santa Fe).

WHAT ARE THE PATTERNS OF LIVESTOCK MOVEMENT WITHIN THE REGION?

From the production viewpoint, cattle operations in Argentina may be classified into clearly differentiated categories: commercial cow-calf operations, small-scale and subsistence farming, fattening and complete cycle. The movement of cattle between regions mirrors the different production systems, and the shipments of young cattle from breeding areas to fattening areas constitute the most important flow.

The extensive breeding areas (Provinces of Formosa, Chaco, Corrientes, Santiago del Estero and North of Santa Fe) have poor soil and grasses that are not suitable for fattening. The typical production system therefore is extractive, limited to selling the calves after weaning.

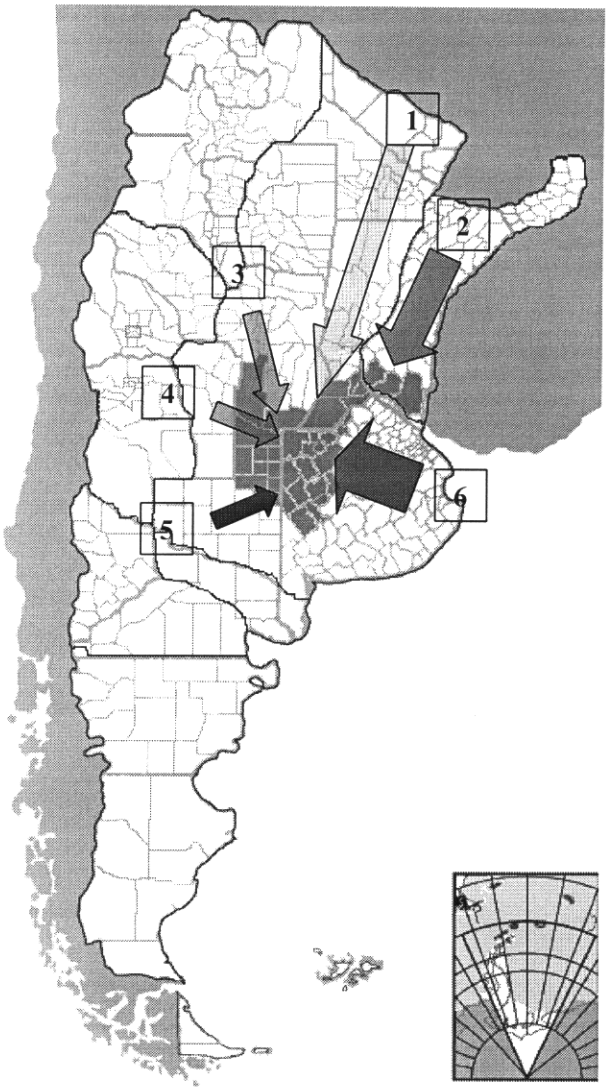
The same production characteristics apply in small areas of the Provinces of Córdoba, San Luis and La Pampa.

The extensive cow-calf production area in the Province of Buenos Aires (the Salado River Basin area) has very poor natural grasslands and, as the seeding of pastures and greenfeed annual crops is not easy, the calves must be shipped to other regions for fattening.

Consequently, the most important flow of animals (mainly calves) is towards the fattening areas which are mainly in the central part of the country - the most important livestock production provinces in terms of livestock population -: Buenos Aires (northwest), La Pampa (northeast), Santa Fe (south), Córdoba and Entre Ríos. The most significant fattening farms, dairy and agriculture operations are in this region that has good soil and good pastures that carry high stocking rates per hectare.

Where the quality of the soil allows breeding and fattening on the same farm (complete cycle), animal shipments are only within the area.

To illustrate the dynamics of animal shipments, below is a map of Argentina showing the above-mentioned fattening area; the arrows represent the principal flow of animals.



1999 data

Arrow	%	NUMBER
1	18.80	935,197
2	27.20	1,353,357
3 and 4	6.85	340,067
5	3.59	178,577
6	43.57	2,167,587
TOTAL	**100.0**	**4,974,785**

Arrow #1 shows the shipments of calves from the provinces North of the Central Region (Formosa, Chaco, Santiago del Estero and north of Santa Fe). This year, 1,246,930 heads were shipped from these four provinces, 75% of which (935,197) went to the fattening area.

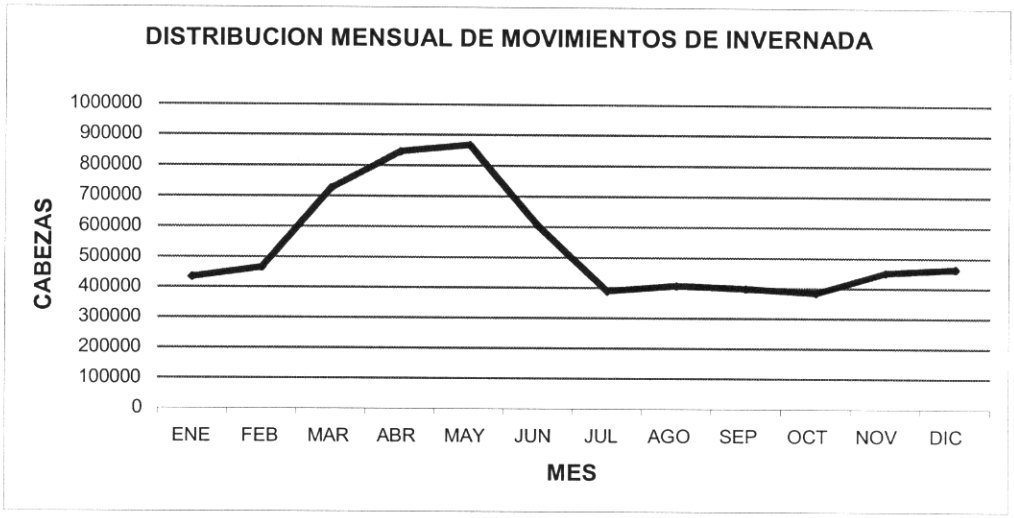
Arrow #2 shows the flow of calves from the breeding area in Mesopotamia (Corrientes and north of Entre Ríos). A total of 1,555,583 animals were shipped to fattening operations, 87% of which (1,353,357) went to the fattening area in the center of the country.

Arrows #3 and 4 show the movements of weaned calves from the breeding areas in the central and northern part of the Provinces of San Luis and Córdoba to the fattening areas. Together, both provinces shipped 755,705 animals, 45% of which (340,067) went to the fattening area in the center of the country.

Arrow #5 shows the movements of animals to fattening operations within the Province of La Pampa. The annual total of animals shipped was 192,018, 93% of which (178,577) went to the main fattening area.

Arrow #6 shows the movements of animals from the Province of Buenos Aires to fattening areas. Buenos Aires ships 2,643,399 heads of cattle for fattening, 82% of which (2.167.587) go to the above-mentioned fattening area.

Graph 2: Monthly distribution of cattle shipments to the fattening areas



Over 66% of the sheep operations in Argentina are in the Patagonia area, which is FMD free with no vaccination (O.I.E. May 2002). There are some sheep farms with large flocks for wool or meat in other regions such as Mesopotamia (mainly in Corrientes and

south of Buenos Aires), but they are declining in number. In other areas, some farmers have only a few sheep as a secondary activity or for on-the-farm consumption.

Hog production in Argentina can be divided into two main categories: large commercial operations with a complete production system (breeding and fattening) that apply stringent biosafety measures and good manufacturing practices throughout the process to produce animals for slaughter in abattoirs owned by the same company or third parties with which they have an agreement. As these operations keep the hogs in pens and operate a complete cycle, the animals are never in contact with other species. For the operations in the second category, the hogs are not their main line of business and the animals are not moved because they are only kept for on-the-farm consumption.

Goat production is not much developed in Argentina. The country has 2,500,000 goats most of which are in marginal areas in the northwestern region simply because this species adapts to unfavorable production conditions. Goat production in the central part of the country is negligible and only some farms have a few goats for on-the-farm consumption.

HOW ARE THE ANIMALS TRANSPORTED AND HANDLED DURING MARKET TRANSACTIONS?

Animals are transported on special vehicles serving only for this purpose. The vehicles must comply with SENASA Resolution # 97/99 which requires approval of the vehicle by SENASA, and SENASA Resolution # 809/82 which states hygiene and sanitation requirements.

The animals are shipped from farms or livestock concentration markets (such as auction markets) to slaughtering plants or to other farms.

To market or move animals, the farmers must be registered and have a RENSPA number (National Register of Farmers as defined in Resolution # 417/97 of the former Secretariat of Agriculture, Livestock, Fisheries and Foodstuffs - see copy of the RENSPA in Annex IX -). Shipment of animals to any destination requires a DTA (Animal Transit Document) (SENASA Resolution # 848/98), and a Provincial Transit Certificate (Guía) that is issued by provincial authorities. A copy of the DTA is attached in Annex X.

The Local SENASA Offices keep a record of the movements of susceptible animals and report this information on a monthly basis to the statistics unit of DNSA (Monthly Statistics - I.E.M.), and to the Technical Management Unit (S.G.S.).

SENASA Resolution # 104/01 and its amendment SENASA Resolution # 414/02, define the inspection procedures at auction markets and other livestock concentration facilities, and the conditions and requirements to ship animals to livestock concentration facilities.

To better control animal shipments and guarantee an adequate follow-up of the animals, Resolution # 178/01 requires mandatory individual branding of the animals, correct identification of the transportation vehicles, and establishes joint liability for the Official staff that issues the health certificate, the owners or persons responsible for the animals, the shippers and the slaughtering plants.

National Animal Health and Agrifood Quality Service

(SENASA)

Risk Analysis Unit

QUESTION 9:

TYPE AND EXTENT OF DISEASE SURVEILLANCE IN THE REGION, E.G., IS IT PASSIVE AND/OR ACTIVE, AND WHAT IS THE QUANTITY AND QUALITY OF SAMPLING AND TESTING

November 2002

9- TYPE AND EXTENT OF DISEASE SURVEILLANCE IN THE REGION, E.G. IS IT PASSIVE AND/OR ACTIVE, AND WHAT IS THE QUANTITY AND QUALITY OF SAMPLING AND TESTING

The epidemio-surveillance system in Argentina has three levels: central, regional and local.

1) CENTRAL LEVEL

The central level includes DNSA, the Epidemiology Office and the National FMD Eradication Committee (CONALFA). The central level analyzes information, defines strategies and general actions, and issues reports.

The Epidemiology and Virology Advisory Committee of the Epidemiology Office, that includes representatives from SENASA, INTA, the Animal Virology Center (CEVAN), and Schools of Veterinary Sciences, offers advice and recommendations for epidemiological surveillance, vaccination campaign follow-up actions, etc.

Most of the information originates from other areas of SENASA, government agencies and international organizations. SENASA issues two reports: a national report and an international report with the information submitted to SENASA's International and Institutional Affairs Office. The international report is distributed to other countries and international bodies such as PAHO/WHO and O.I.E.

The Epidemiology Office is responsible for:

- The analysis and follow-up of the epidemiological process.
- The follow-up of the National FMD Program.
- Communication and training.

The information collected by the Local Offices is reported to the central level where it is analyzed by the pertinent units. The reports are issued by DNSA.

2) REGIONAL LEVEL:

The regional level includes SENASA's Regional Supervisors and the Provincial Animal Health Committees (COPROSAS). This level functions as liaison between the central level and the local offices, manages and assesses health documentation, and supports the Local Animal Health Offices with human and economic resources. The regional level is also responsible for managing and harmonizing the national strategies.

3) LOCAL LEVEL:

The local level, which includes the local SENASA offices and the animal health NGOs, is the operational level and the main source of information (health protocols, reports on suspect cases, collection of specimen for laboratory testing, etc.).

The Epidemiological Surveillance System for FMD includes:

Active Surveillance: actions carried out by SENASA to identify: a) viral activity with no clinical symptoms; and b) lesions compatible with the disease.

A) Viral Activity with no clinical symptoms

- Random serum sampling to determine prevalence of the infection.
- Targeted serum surveys of premises affected with FMD and adjacent farms to identify viral activity, bleeding of animals born after an outbreak is closed, animals that previously tested negative, non-vaccinated susceptible species.
- Viral isolation in animals that tested positive in serum (Probang, PCR).

B) Lesions compatible with the disease

- Inspection of animals prior to shipment for Slaughter to Export (SENASA Resolution # 115/2002.
- Inspection of animals prior to shipment to livestock concentration facilities (SENASA Resolution # 104/2002 and 414/2001).
- Inspection at Livestock Auction Markets.
- Inspection of animals at public weighing stations.
- Inspection at Livestock Concentration Markets of animals for slaughter (Liniers and Rosario).
- Ante mortem inspection.
- Inspection of mouth and feet at the time of slaughter.
- Inspection of farming operations by trained vaccinators for surveillance purposes.

Passive Surveillance: Spontaneous reporting by farmers, private veterinarians, livestock or milk shippers, livestock dealers, etc.

SENASA Resolution # 234/96 establishes the National Epidemiological Surveillance System that requires all players in the farming sector - the farmers, veterinary physicians, cattle dealers, slaughtering plants, cattle shippers, diagnostic laboratories, etc. -, to report FMD compatible diseases and others for which reporting is mandatory.

Notification and recording of outbreaks and suspect cases of vesicular diseases: Section 9 of Act # 24,305 states that FMD is a disease that must be reported immediately by individuals and/or companies that know about, or suspect the presence of the disease. Sections 46, 47, 48, 49 and 50 of Regulatory Decree # 643/96 of the FMD Act require mandatory reporting and describe the reporting process. When a case is re-

ported to the Local SENASA Office, the official veterinarian must inspect the farm, prepare a protocol (Resolution # 383/2001), and fax the protocol to the Epidemiology Office within a period of 24 hours.

The Analysis and Outbreak Recording Unit of the Epidemiology Office analyses and classifies the health reports into one of the following categories: outbreak, suspect case of vesicular disease, or report of an FMD compatible disease.

SENASA's Central Laboratory receives and tests the samples remitted by the Local SENASA Offices. The test results are sent by fax to the Epidemiology Office and the Local SENASA Office that sent the samples. The test results are also sent by e-mail to the Regional Supervisors.

LABORATORY TESTING OF SUSPICIOUS ANIMALS. IF YES, WHAT PROCEDURES AND TO WHAT EXTENT (E.G., WHAT PROPORTION OF SUSPICIOUS CASES ARE EVALUATED USING EACH OF THE SPECIFIC LABORATORY PROCEDURES)?

The actions required when a vesicular disease or a suspect case is reported, including the procedures for collection and remittance of samples to the laboratory for testing, are defined in current statutes, the Procedures Manual, and Internal Procedures.

When the Veterinary Physician of the Local SENASA Office receives a report of a suspect case and his diagnosis does not confirm the absence of the FMD virus, the veterinarian must collect epithelium samples from mouth or foot lesions for virus identification purposes.

If the Official Veterinarian considers that the quantity or quality of the samples does not meet the minimum standards, a representative number of blood samples of the herd is required; the animals must be identified and bled again after twenty or thirty days.

In addition, esophageal-pharyngeal fluid may be collected. The epithelium and esophageal-pharyngeal fluid samples are tested by ELISA for virus typing and cell culture. The blood samples are tested to identify non-structural antibodies for the FMD virus by 3 ABC ELISA and the test results are confirmed with EITB.

The only diagnostic laboratory approved for viral testing of suspect animals is SENASA's Central Laboratory.

ARE QUARANTINES IMPOSED ON PREMISES WITH SUSPICIOUS CASES, PENDING FINAL DIAGNOSIS?

Yes, premises are quarantined until the final diagnosis is issued.

ARE SERUM SURVEYS CONDUCTED, AND IF SO, HOW FREQUENTLY, WHAT SAMPLE SIZES ARE USED, AND WHAT HAS BEEN FOUND?

Yes. Active epidemio-surveillance actions include serum surveys to identify and measure viral activity. Serum testing as a tool, is used regularly because it provides a legitimate measure and interpretation to define the progress of the National Program. The design of the survey (e.g. sample size, regions and subregions into which the country is divided, etc.), was adjusted based on the epidemiological status at the time of the survey and the goals that were set.

Seroepidemiological Surveillance in 2001:

A countrywide serum survey was conducted at the end of 2001 when the epidemic was declining[2], to identify viral activity and estimate the level of immunity provided by the vaccine.

The survey included the areas that were affected by FMD outbreaks to measure the level of viral activity. A targeted statistical sampling was designed for three focal areas, perifocal / surveillance areas, and others, in each one of the FMD ecosystems into which the country is divided. In the Central and Mesopotamia region, the goal was to measure viral activity in the areas affected by outbreaks (focal, perifocal/surveillance areas, and others), whereas in low prevalence regions (NOA, Cuyo and Northern Patagonia A) an additional goal was to identify viral activity where no cases had been reported.

As expected, the prevalence of viral activity in the Central and Mesopotamia regions, was higher in the focal area and lower in the other two (perifocal/surveillance, and others), confirming the hypothesis of more viral activity in the area affected by cases with clinical symptoms. In all the regions, the results confirmed that the reports were adequately recorded and that the disease was positively identified at an early stage.

A comparison of the data from the Central - Mesopotamia regions shows a 13.8% prevalence in positive bovines in the focal area, 4.4% in the perifocal / surveillance area, and 1.5% in others. In sheep, the prevalence was 5.38%, 1.22% and 0.1%, in each region, confirming the same principle and the expected lower prevalence levels.

[2] The size of the sample was defined based on the "CSURVEY" criteria, with an expected prevalence of 5% in bovines, 2% in sheep, and a 95% confidence level.

The same principle was confirmed in the Northwest and Cuyo regions. In other areas, the absence of viral activity in cattle was confirmed. In sheep, serum testing showed no evidence of viral activity.

The behavior of the disease in the Northern Patagonia A region was similar to the one observed in the Northwest and Cuyo regions.

The tables included below illustrate the protection level attained in vaccinated cattle on premises with no viral activity (a subsample of EITB negative farms).

Table 4: Level of antibodies in vaccinated cattle on premises with no viral activity in different regions of the country (Central area, Mesopotamia, Northern Patagonia A, Northwest and Cuyo) in 2001.

Central - Mesopotamia Regions -151 operations/n = 2,166 animals

	O 1 Campos	A 24	A 2000	A 2001
Very high protection Titres > 2.10	89%	91%	84%	83%
High protection Titres: 1.80 to 2.10	6%	6%	7%	8%
Average protection Titres: 1.60 to 1.80	3%	1%	5%	4%
Low protection Titres < 1.60	2%	2%	4%	5%

Northern Patagonia Region – 180 operations/n = 1,866 animals

	O 1 Campos	A 24	A 2000	A 2001
Very high protection Titres > 2.10	82%	90%	76%	71%
High protection Titres: 1.80 to 2.10	10%	4%	11%	12%
Average protection Titres: 1.60 to 1.80	4%	2%	5/%	6%
Low protection Titres < 1.60	5%	4%	8%	11%

Northwest - Cuyo Region -163 operations/n = 2,193 animals

	O 1 Campos	A 24	A 2000	A 2001
Very high protection Titres > 2.10	75%	82%	73%	68%
High protection Titres: 1.80 to 2.10	10%	8%	10%	10%
Average protection Titres: 1.60 to 1.80	8%	2%	8%	7%
Low protection Titres < 1.60	7%	8%	9%	15%

Table 5: Antibody protection levels in vaccinated cattle on premises with no viral activity. 2001.

Country total n = 6,215 - Young animals n = 4,972 - (Young animals: 1 to 2 years old)

	O1 Campos	A24	A 2000	A 2001
Very high protection Titres > 2.10	81%	88%	77%	72%
High protection Titres: 1.80 to 2.10	10%	6%	10%	11%
Average protection Titres: 1.60 to 1.80	5%	2%	6%	6%
Low protection Titres < 1.60	4%	4%	7%	11%

Older animals n = 1,243 - (Animals over 2 years old)

	O1 Campos	A24	A 2000	A 2001
Very high protection Titres > 2.10	86%	88%	82%	80%
High protection Titres: 1.80 to 2.10	5%	5%	7%	7%
Average protection Titres: 1.60 to 1.80	4%	1%	5%	4%
Low protection Titres < 1.60	5%	6%	6%	9%

Table 6: Antibody protection levels in vaccinated cattle on premises with no viral activity in different regions of the country. 2001.

Country total 494 operations/n = 6,215 - n/operations: - Central-Mesopotamia and Northwest-Cuyo n = 15, Northern Patagonia A n = 10

	O 1 Campos	A 24	A 2000	A 2001
Very high protection Titres > 2.10	82%	88%	78%	74%
High protection Titres 1.80 to 2.10	9%	6%	9%	10%
Average protection Titres 1.60 to 1.80	5%	2%	6%	6%
Low protection Titres < 1.60	5%	5%	7%	10%

2002 Survey:

The annual serum survey was conducted this year to measure and assess the results of the actions required by the FMD Eradication Program.

ASSESSMENT OF THE LEVEL OF ACTIVITY OF THE FMD VIRUS IN CATTLE AND SHEEP

GOAL

- To assess the level of activity of the Foot and Mouth Disease Virus (FMDV) in the different regions of the country that were affected by FMD outbreaks in the period 2000 - 2001.
- To rule out the presence of FMD infected animals in regions where no outbreaks were detected or in which the occurrence of FMD was sporadic in the period 2000 - 2001.

VARIABLE TO BE MEASURED

Presence of antibodies for non-structural proteins of the FMD virus in cattle and sheep/goats, as an indicator of infection.

DESIGN

The country was divided into the 3 regions defined by the vaccination strategies and the frequency of the FMD outbreaks. The regions were then subdivided into 15 subregions, following the regionalization criteria stated in the FMD Eradication Program and the production characteristics of the areas:

Region A

- Goal: To assess the level of activity of the FMD virus
- Systematic vaccination of cattle
- High frequency of FMD outbreaks in the period 2000 - 2001 (2457 outbreaks)
- Includes the Central and Mesopotamia Regions and is subdivided into 7 sub-regions (A1 to A7) **Diagram 1**.
- Species sampled: Bovines and sheep/goats.

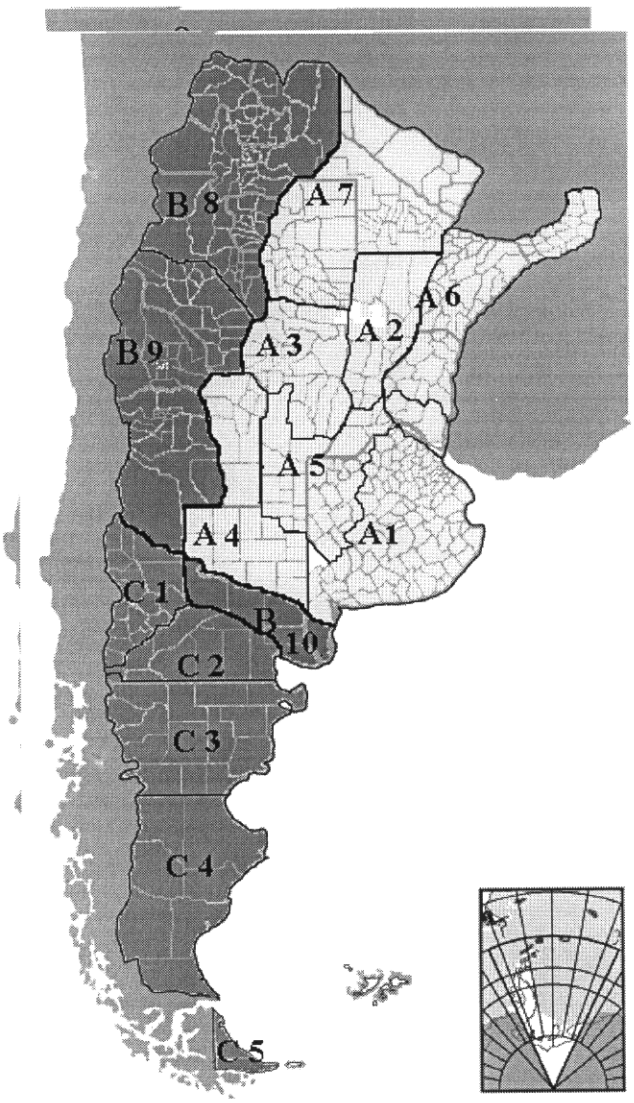
Region B

- Goal: To rule out the presence of animals infected with the FMD virus.
- Systematic vaccination of cattle.
- Sporadic appearance of FMD outbreaks in the period 2000 - 2001 (16 out-breaks).
- Includes the NOA, Cuyo and Northern Patagonia A Regions. Subdividided into 3 subregions (B8 to B10) **Diagram 1.**
- Species sampled: Bovines.

Region C

- Goal: To rule out the presence of animals infected with the FMD virus.
- No vaccination.
- Absence of clinical cases (FMD free area with no vaccination and Surveillance Area with no vaccination).
- Includes the Northern Patagonia B and Southern Patagonia Regions. Subdivided into 5 subregions (C1 to C5) **Diagram 1.**
- Species sampled: Bovines (subregions C1 and C2) and sheep (C1, C2, C3, C4 and C5).

Diagram 1



Age categories of the individuals of each species that were sampled:

- Bovines
  - Category 1: 6 to 12 months.
  - Category 2: 12 to 24 months.
- Sheep / goats

  Any age, not vaccinated.

Number of samples collected per operation:

Region A:

- 5 bovines 6 to 12 months
- 4 bovines 12 to 24 months
- 5 sheep / goats

Region B:

- 10 bovines 6 to12 months
- 10 bovines 12 to 24 months

Region C:

- 28 bovines 6 to 24 months
- 28 sheep / goats

DIAGNOSTIC TECHNIQUES

For bovine serum samples: 3 ABC ELISA (screening) and EITB (for confirmation).

For ovine serum samples: VIAA / IDGA test.

Criteria to read test results:

- Positive test result of a bovine sample: a sample that tests positive by 3 ABC ELISA and EITB.
- Positive test result of an ovine sample: a sample that tests positive by VIAA.
- Positive operation: An operation where at least one bovine, or ovine / caprine sample tested positive.

NUMBER OF SAMPLES TESTED

Seventy-eight per cent of the universe of samples planned (88,672), were collected and tested (69.017). The difference in the number was due to:

- Operational problems at the time of collecting the samples in the field.
- Samples not tested in the laboratory because of identification and/or temperature problems.

Table # 1: Total number of samples tested, per area:

AREA	BOVINES	OVINE / CAPRINE	TOTAL
A	21,671	9,171	30,842
B	14,893	-	14,893
C	5,292	17,990	23,282
TOTAL	**41,856**	**27,161**	**69,017**

RESULTS

SPECIES	AREA	AGE GROUP			
		6 TO 12 MONTHS		1 TO 2 YEARS	
		% PREVALENCE	C.I.	% PREVALENCE	C.I.
BOVINE	A	0.63	0.43 -0.83	2.16	1.75-2.57
BOVINE	B	0.22	0.11-0.33	1.49	0.98-2.00
BOVINE	C	0.16	0.02-0.30	0.34	0.00-0.78

SPECIES	AREA	% PREVALENCE	C.I.
OVINE / CAPRINE	A	0.64	0.39-0.90
OVINE / CAPRINE	C	0.00	--

CONCLUSIONS

- The samples that were collected and tested served to estimate the parameters with a high degree of precision.
- As expected, the prevalence in 12 to 24 month-old cattle was higher than in the 6 to 12 month-old age group because the animals in Category 2 were exposed for a longer period of time precisely when the number of clinical cases of the disease was highest.
- The ratio of the prevalence in cattle between both age categories (2 and 1) indicates a decline in the incidence level along the time line.
- As most of the sheep / goats that were sampled were adults, the prevalence in these species (not subject to systematic vaccination) when compared to bovines

in Category 2, strengthens the hypothesis that these species play a secondary role in hosting and spreading the FMD virus with the production and management schemes used in our country.

- The higher level of viral activity found in Region A and particularly in subregions 1 and 5, is consistent with the higher number of outbreaks with clinical symptoms during the 2000-2001 epidemic.
- Prevalence in positive 12 to 24 month-old bovines in subregion B9 was relatively high and similar to the prevalence in subregions 1 and 5 of Region A. This suggests that in 2001 the number of infected farms in subregion B9 was significantly higher that the number of farms with a clinical presence of the disease (4 operations). Oppositely, the low prevalence in 6 to 12 month-old bovines suggests that the 12 to 24-month old cattle was mainly exposed during the first year of their life and that the incidence of the infection dropped significantly as time progressed.
- Given the situation in 2000 and 2001, the overall low prevalence level indicates that the measures taken to control the epidemic as of the first half of 2001 were successful to eliminate the disease and significantly restrict the spreading of the FMDV.

IS REPORTING OF SICK ANIMALS MANDATORY, AND IF SO, WHAT IS THE PROCEDURE (BY WHOM AND TO WHOM) AND WHAT PENALTIES ARE INVOLVED FOR FAILURE TO REPORT?

Act # 24,305 requires immediate and mandatory reporting of Foot and Mouth Disease in Argentina. As stated in FMD statutes, SENASA has authority to apply severe penalties to any individual or company that does not report a case of FMD.

Awareness among farm owners was clearly demonstrated in March 2001 when over 300 cases or suspect FMD cases were reported.

As stated in the Animal Health Law Enforcement Authority Act (# 3959) all veterinarians in private practice that work in rural areas (5,752) must report epizootic diseases. In addition, as these professionals sit on the board of the technical subcommittees of the Regional and Local Animal Health Committees they are highly motivated and support the national eradication programs. Private diagnostic laboratories are also required to immediately report epizootic diseases. Failure to comply with statutory requirements is subject to severe penalties.

On the farms, as the owner or person in charge sees the animals every day, they are well aware of the FMD symptoms, the reporting requirements, and the resources available to avoid the disease.

Twice a year, when the staff of the Local Animal Health Offices visit the farms to vaccinate cattle, they physically see the animals, collect information on the animal population, provide information about preventive measures, and generate awareness about the plan, contributing to the efficiency of the surveillance system.

The INTA (National Farming Technology Institute) and its network of Experimental and Extension facilities, work with the farmers and receives updated information on the health conditions of the herds.

National Animal Health and Agrifood Quality Service

(SENASA)

Risk Analysis Unit

QUESTION 10:

DIAGNOSTIC LABORATORY CAPABILITIES

November 2002

10- DIAGNOSTIC LABORATORY CAPABILITIES

WHAT DIAGNOSTIC LABORATORY CAPABILITIES ARE THERE?

In Argentina, SENASA has one diagnostic laboratory with biosafety level NBS3 Ag that was approved in 1997. The laboratory is authorized to manipulate FMDV and other microorganisms risk 3 or lower, and meets SENASA and O.I.E. biosafety requirements. It is located at 1653 Fleming Av., Martínez, Buenos Aires.

In 2001, the FMD Unit of the Laboratories and Technical Control Office (DILACOT) focused on the sanitary emergency which resulted by the re-importation of the disease in 2000.

For the sanitary emergency, the Central Laboratory focused on:

- Diagnosis.
- Vaccine control.
- Serum sampling.

Diagnosis:

Diagnostic work included testing of all epithelium samples collected from FMD outbreaks and suspect cases of vesicular diseases, typing and identification of actuating strains which, in that year were two different type A FMDV strains which, after identification, were named A Argentina 2000 and A Argentina 2001.

Vaccine Control:

Immunity testing to identify the most appropriate oil-base FMD vaccine for the existing emergency conditions. The findings indicated that the vaccine should contain O1 Campo, A 24 Cruzeiro, A ARGENTINA 2000 and A ARGENTINA 2001.

The Central Laboratory also audited and inspected the critical production points at the vaccine manufacturer's facilities, and tested all the series of vaccines used during the year, as required in Resolution # 195/01.

Ninety-three series with a total production of 11,639.277.593 - 2 ml doses of the vaccine were tested.

DILACOT also tested an additional 15 series (16,406,120 doses) that were exported to other countries.

Serum Sampling:

Serum samples of different susceptible species were tested, as required by the 2001 serum survey designed by the Epidemiology Office to determine the level of viral activity and immunity in different regions of the country.

To determine viral activity, non-structural protein antibodies of the FMDV were tested in 8810 bovine samples with 3 ABC ELISA and EITB. The protection level in bovines on premises with no viral activity was measured in 6215 samples from 494 operations.

Ovine serum samples (6140 samples) were tested with VIAA to measure viral activity.

The 2002 serum survey to measure viral activity and immunity is almost completed.

Audits:

In 2000, the laboratory was audited by foreign inspectors from the European Union and the Pan American FMD Center - PAHO, among others. The scope of the audits included working procedures, quality programs, and biosafety conditions. The findings were satisfactory.

ARE THERE LABORATORIES APPROVED FOR AGENT ISOLATION, IDENTIFICATION, AND TYPING? (IF YES, INDICATE THE NAMES AND ADDRESSES OF EACH).

All tissue, organ, esophageal-pharyngeal fluid, and other samples of suspect cases of vesicular diseases must be remitted to SENASA's Central Laboratory (Operational Procedures and Working Instructions Manual - Virology Unit - SENASA 2001. Former SENASA Resolution # 219/95 - Annex XI).

WHAT SECURITY MEASURES ARE IN PLACE IN LABORATORIES WITHIN THE REGION TO PREVENT ESCAPE OF BIOLOGICAL AGENTS?

SENASA's laboratory with NBS3 Ag biosafety level includes:

- Restricted and controlled access;
- Airtight compartments and mandatory showering;
- Negative air flow with two HEPA filters;
- Heat treatment of liquid effluents (100°C during 1 hour);
- Border autoclave;
- Airlock with formaldehyde spraying;
- Category II biosafety booths;
- Electric energy generator.

The Argentine biosafety requirements to manipulate the FMD virus are stated in former SENASA Resolution # 219/95.

WHAT KIND OF TRAINING HAVE THE DIAGNOSTIC PERSONNEL HAD REGARDING THE SPECIFIC DISEASE AGENTS OF CONCERN?

The staff of SENASA's Central Laboratory is trained in manipulating and diagnosing the FMD virus. The 5 veterinarians and 8 laboratory technicians of the FMD Unit have a high level of expertise in diagnosing vesicular diseases and testing FMD vaccines.

The Virology Advisory Committee was established in 1992. Its members include professionals from the INTA (National Farming Technology Institute) and the Animal Virology Center (CEVAN) of the National Council for Technical and Scientific Research (CONICET). The Virology Advisory Committee, that continuously provides support to SENASA, has the best technical and human resources in the country.

National Animal Health and Agrifood Quality Service

(SENASA)

Risk Analysis Unit

QUESTION 11:

POLICIES AND INFRASTRUCTURE FOR ANIMAL DISEASE CONTROL IN THE REGION, i.e., EMERGENCY RESPONSE CAPACITY

November 2002

11- POLICIES AND INFRASTRUCTURE FOR ANIMAL DISEASE CONTROL IN THE REGION, i.e., EMERGENCY RESPONSE CAPACITY

WHAT POLICIES AND INFRASTRUCTURE EXIST FOR EMERGENCY RESPONSE TO OUTBREAK SITUATIONS?

The outbreaks which occurred as of October 2001 were managed in accordance with an eradication strategy that required stamping out[3], among other measures, to preserve the health status of the FMD free areas. All the measures included in the strategy comply with the recommendations stated in the FMD Chapter of the International Animal Health Code of the O.I.E.

By Decree # 394/2001 that updated Decree # 1585/1996, the President of SENASA has authority to take prompt actions to respond to emergency situations involving animal health. SENASA has special policies, logistics and a budget for zoosanitary and phytosanitary emergency situations.

The National Animal Health Emergency System (SINAESA) defines the responsibilities and functions to control FMD in emergency situations. The SINAESA operates at three levels: Central, Regional and Local.

At the central level, there is a Central Animal Health Emergency Committee that is responsible for describing the emergency scenario, defining the control measures, financing mechanisms and responsibilities, and assigning the human and other resources required for the eradication operations.

[3] Stamping-out is required in risk situations such as: clinical cases of FMD, importation of animals or products from infected areas or areas presumed to be infected, inadequate coverage of the vaccine.

At the regional level, the actions required by SINAESA are carried out by SENASA's regional resources. The Regional Animal Health Emergency Team, that is coordinated by the Epidemiology Office of DNSA at SENASA headquarters (DNSA Collective # 30/20), constitutes the functional unit of the system. The team includes SENASA professionals, technicians and administrative staff specialized in responding to emergency situations. The members of the team were especially selected for their technical and psychophysical profile because, in cases of emergency, they must be continuously available and able to respond immediately. An alternate person was appointed for each member of this team in the event one member is unable to respond. Each Regional Animal Health Emergency Team operates within the jurisdiction of the corresponding SENASA Regional Supervisor although, in the event of an emergency, one team may provide collaboration to others.

In all cases, the staff of the Local SENASA Office in the affected area collaborates with the group of Field Technicians to provide support.

The Local SENASA Office is required to:

1. Provide a primary response to suspect cases (collection and remittance of samples, description of the operation, and implementation of preliminary measures).
2. Notify the Regional Supervisor.
3. Submit a status report to the Local Animal Health Emergency Committee.
4. Carry out the actions defined by the chief of operations.

In addition, the Local SENASA Office must:

a. Supply updated maps of their area, including cadastre drawings.

b. Keep updated records on the characteristics of the production system in their area, including a geographic description.

c. Keep updated information on local suppliers and service suppliers such as: mobile telephone companies, equipment suppliers, transportation and rental companies of said equipment, trucks, etc.

d. Keep updated information on the livestock population, inventory of other products, shippers of animal products and byproducts, cattle dealers, other professionals related to the farming sector (veterinarians, agronomists, cattle buyers, dairy farm inspectors, etc.)

e. Keep updated records of the local authorities such as: Municipal, Law Enforcement Authorities, Fire brigade, veterinarians in private practice, and others in the area).

f. Oversee the surveillance and repopulation of farming operations.

Regulatory Framework for Emergency Animal Health Situations:

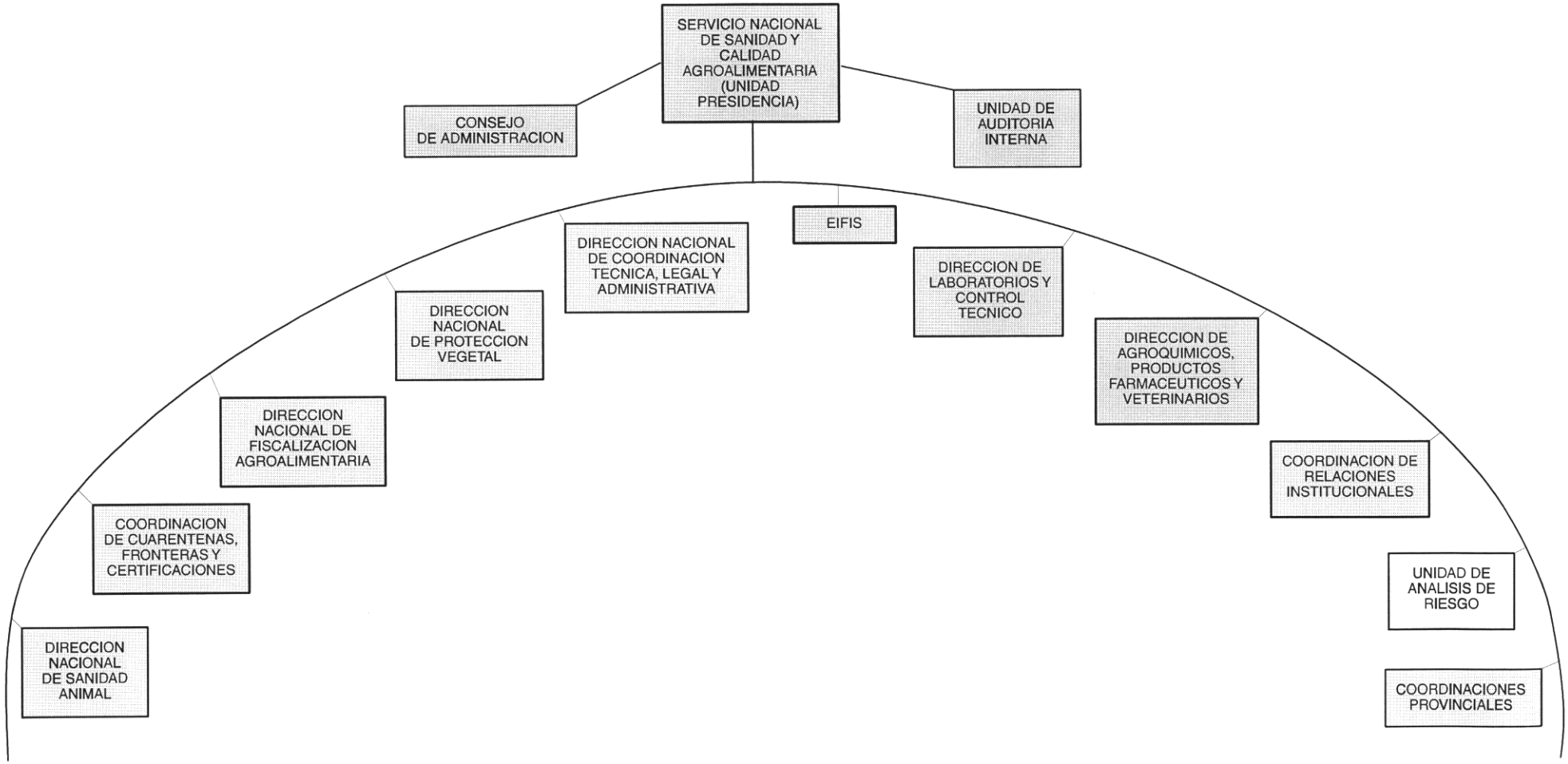
In the event of an outbreak of an exotic or endemic disease that represents a hazard for the health of the national livestock herd, and if the Official Service determines a stamping-out policy, SENASA's actions and level of involvement are defined in Resolutions # 1410/2000 and 488/2002. These actions are listed in Resolution # 779/1999 by which the National Animal Health Emergency System, as authorized by Act # 24,305 enacted in 1993, Decrees # 1585 (1996) and #643 (1996), and the Animal Health Law Enforcement Act (#3959) enacted in 1902, was created.

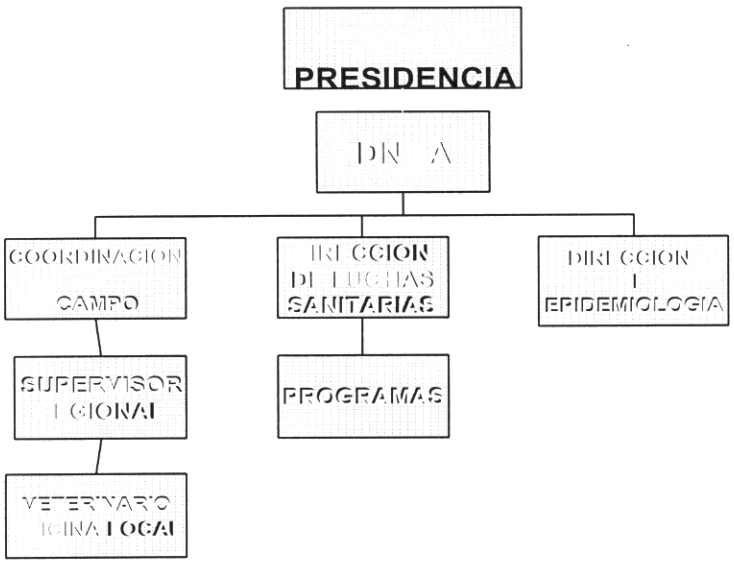
NATIONAL ANIMAL HEALTH AND AGRIFOOD QUALITY SERVICE

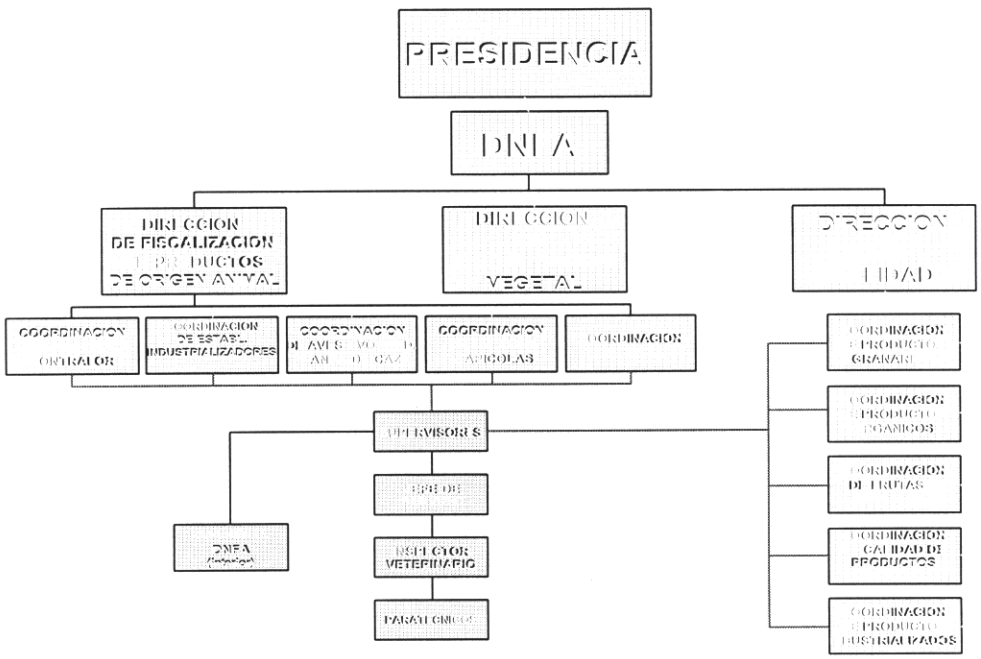
APPENDIX 1:

THE AUTHORITY, ORGANIZATION, AND INFRASTRUCTURE OF THE VETERINARY SERVICES ORGANIZATION IN THE REGION.

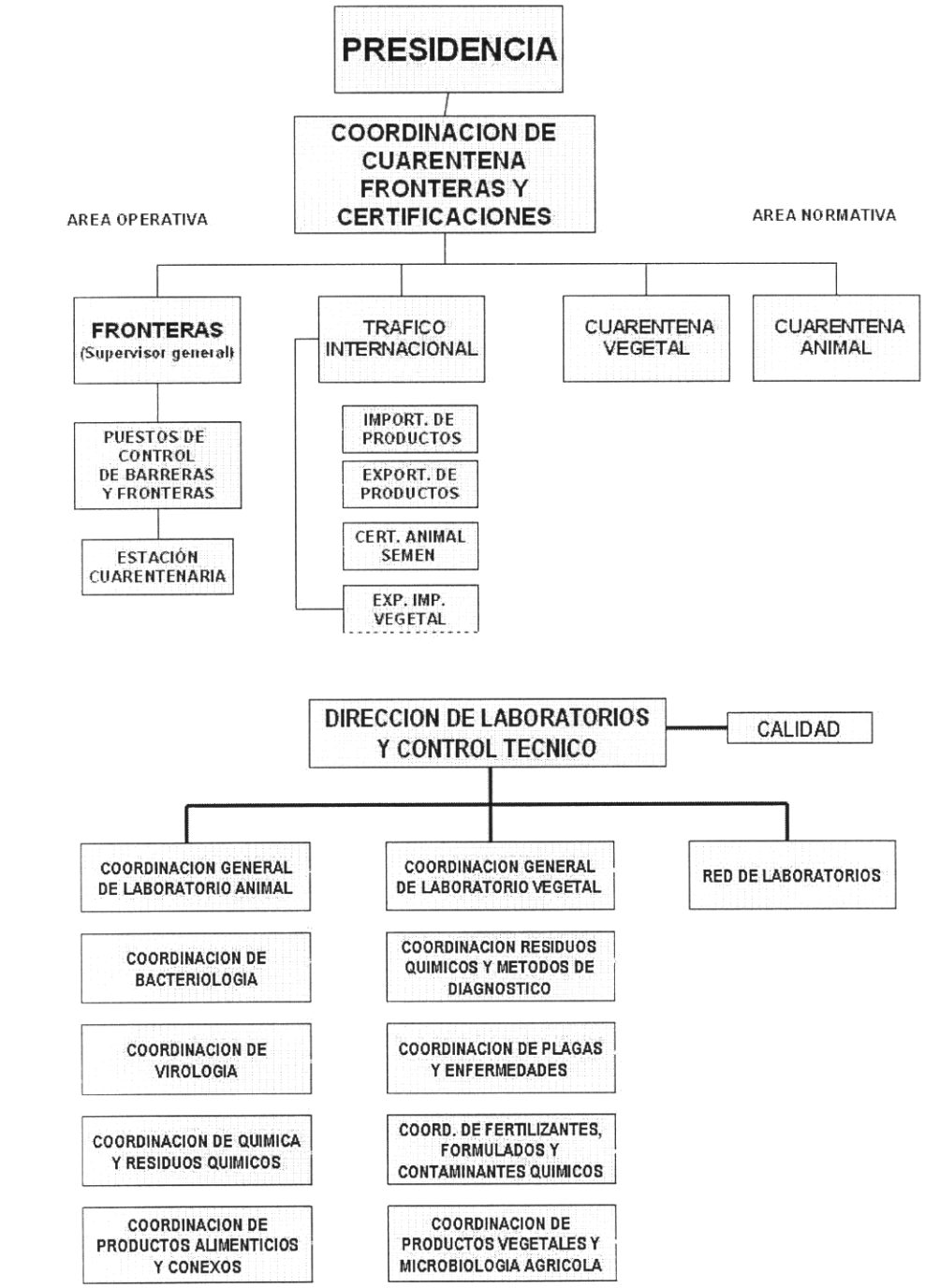
November 2002


SERVICIO NACIONAL DE SANIDAD Y CALIDAD AGROALIMENTARIA (UNIDAD PRESIDENCIA)
CONSEJO DE ADMINISTRACION
UNIDAD DE AUDITORIA INTERNA
DIRECCION NACIONAL DE SANIDAD ANIMAL
COORDINACION DE CUARENTENAS, FRONTERAS Y CERTIFICACIONES
DIRECCION NACIONAL DE FISCALIZACION AGROALIMENTARIA
DIRECCION NACIONAL DE PROTECCION VEGETAL
DIRECCION NACIONAL DE COORDINACION TECNICA, LEGAL Y ADMINISTRATIVA
EIFIS
DIRECCION DE LABORATORIOS Y CONTROL TECNICO
DIRECCION DE AGROQUIMICOS, PRODUCTOS FARMACEUTICOS Y VETERINARIOS
COORDINACION DE RELACIONES INSTITUCIONALES
UNIDAD DE ANALISIS DE RIESGO
COORDINACIONES PROVINCIALES



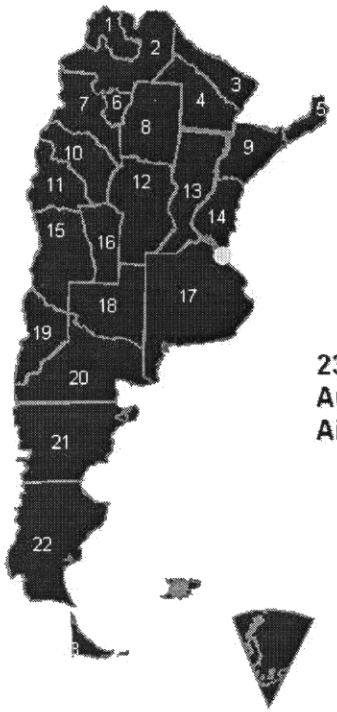


SENASA – Risk Analysis unit


PRESIDENCIA
COORDINACION DE CUARENTENA FRONTERAS Y CERTIFICACIONES
AREA OPERATIVA
AREA NORMATIVA
FRONTERAS
(Supervisor general)
TRAFICO INTERNACIONAL
CUARENTENA VEGETAL
CUARENTENA ANIMAL
PUESTOS DE CONTROL DE BARRERAS Y FRONTERAS
ESTACIÓN CUARENTENARIA
IMPORT. DE PRODUCTOS
EXPORT. DE PRODUCTOS
CERT. ANIMAL SEMEN
EXP. IMP. VEGETAL
DIRECCION DE LABORATORIOS Y CONTROL TECNICO
CALIDAD
COORDINACION GENERAL DE LABORATORIO ANIMAL
COORDINACION GENERAL DE LABORATORIO VEGETAL
RED DE LABORATORIOS
COORDINACION DE BACTERIOLOGIA
COORDINACION RESIDUOS QUIMICOS Y METODOS DE DIAGNOSTICO
COORDINACION DE VIROLOGIA
COORDINACION DE PLAGAS Y ENFERMEDADES
COORDINACION DE QUIMICA Y RESIDUOS QUIMICOS
COORD. DE FERTILIZANTES, FORMULADOS Y CONTAMINANTES QUIMICOS
COORDINACION DE PRODUCTOS ALIMENTICIOS Y CONEXOS
COORDINACION DE PRODUCTOS VEGETALES Y MICROBIOLOGIA AGRICOLA

Argentina is divided into 23 provinces. The capital district of the nation is Buenos Aires City.

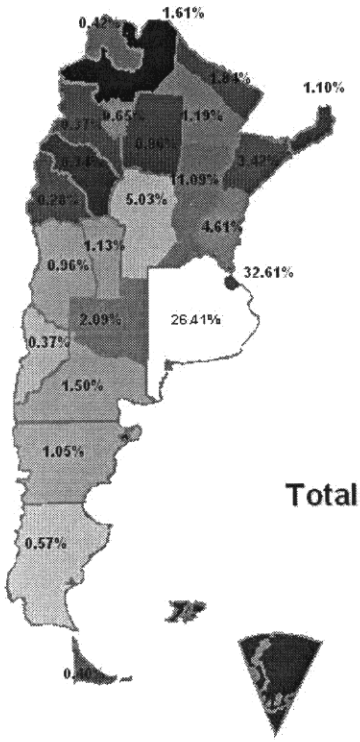
1	Jujuy
2	Salta
3	Formosa
4	Chaco
5	Misiones
6	Tucumán
7	Catamarca
8	Santiago del Estero
9	Corrientes
10	La Rioja
11	San Juan
12	Córdoba
13	Santa Fé
14	Entre Ríos
15	Mendoza
16	San Luis
17	Buenos Aires
-	Ciudad de Bs. As.
18	La Pampa
19	Neuquen
20	Rio Negro
21	Chubut
22	Santa Cruz
23	Tierra del Fuego
●	Islas Malvinas



23 provincias y Ciudad Autónoma de Buenos Aires

This map shows the total SENASA personnel per province (in percentage)

Distribución del personal total por provincia

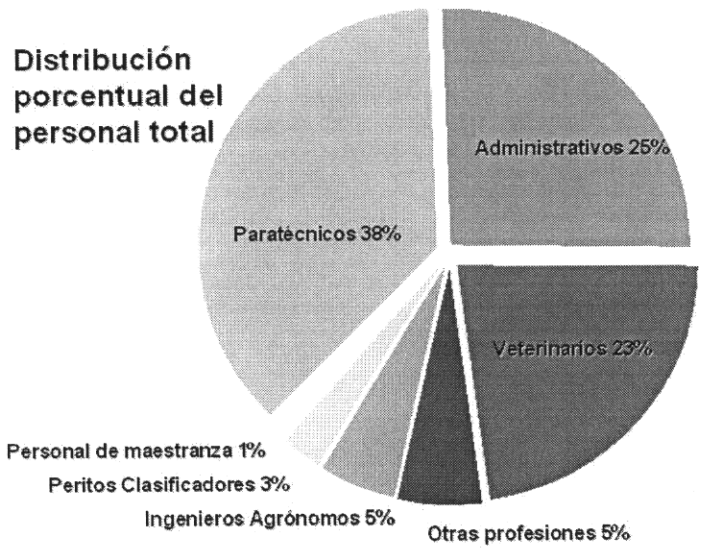


Total personal: 3.536

ARE ALL OFFICERS VETERINARIANS?

Distribución del personal de planta permanente y contratados

Actividad	Planta permanente	Contratados
Veterinarios	576	221
Ingenieros Agrónomos	149	29
Otros	159	55
Paratécnicos	1046	347
Administrativos	635	280
Personal de maestranza	29	10
TOTAL	**2.594**	**942**



SENASA – Risk Analysis unit

Personal de apoyo sanitario por convenio con otras Instituciones

•Fundaciones: (Total)	**4.283**
Vacunadores	3.831
Programadores	452
•Barreras (47) (Río Barrancas y Colorado: 14, Neuquen-Rio Negro: 10, Paralelo 42:3, Mesopotamia: 3, NOA: 11, Cuyo: 6)	**371**
•Institutos de investigación: (Total)	**5.497**
INTA	4.400
CEVAN	35
INTI	1.062
Facultades: (Total)	**2.882**
Buenos Aires	912
La Plata	490
Tandil	209
La Pampa	190
Rio IV	250
Corrientes	330
Mendoza	501

Personal de apoyo sanitario por convenio con otras Instituciones

•Profesionales Privados, Provinciales y Municipales: (Total)	**39.200**
Médicos Veterinarios (Colegios 22)	14.200
Ingenieros Agrónomos (Colegio 1)	25.000
•Fuerzas de seguridad: (Total) (Gendarmería (*), Prefectura,Policía Provincial y Aeronáutica Nacional)	**32.000**
(*) Personal permanentes en operativos	200